

## Assessment of noise level in different zones of Haridwar City, Uttarakhand

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**Abstract:** The present study indicates that Haridwar city suffering from higher level of noise pollution as compared to standard stipulated by Central Pollution Control Board (CPCB), New Delhi. The main sources of higher noise level in Haridwar city due to transportation activities. For this purpose present study was carried out at 16 different locations with Sound Level Meter to assess the day and night sound level in Haridwar City. Haridwar city one of the crowded city in the world. So an attempt has been made in city of Haridwar to measure noise level and also made recommendations to overcome this noise pollution in Haridwar. [Researcher 2010;2(7):56-59].

**Keywords:** Haridwar city; noise pollution; Central Pollution Control Board (CPCB); New Delhi

### Introduction:

The word noise is derived from Latin word, *nausea*. Noise may be defined as 'wrong sound in the wrong place, at the wrong time' (Chauhan, 2008). India and all other countries are facing noise pollution problem for a long period due to increasing number of vehicles, musical instruments, small scale industries, urbanization and human activities are the main source of noise pollution. According to Robert Koch a Nobel Prize Winner German bacteriologist "A day will come man will have to fight merciless noise as the worst enemy of health" (Chauhan *et al.*, 2010). Even the non living things are not left unaffected by high intensity of noise (Pawar and Joshi, 2005). Communication through speech, sounds from playing children, music, natural sounds in parklands, parks and gardens are all examples of sounds essential for satisfaction in everyday life. But in the modern world, development in technology, commerce, communication and education has enhanced the urban growth both in developed and developing countries (Padhy and Padhi, 2008).

Noise has a significant impact on the quality of life (WHO, 1980). A general survey carried out in four major cities including Mumbai showed that 36% of the population has bilateral sensor neural hearing loss (Sangal, 2002). According to the researches, noise pollution caused by traffic is one of the major problems in the southern large Cities of Sweden (Skanberg and Ohrstrom, 2002 and Bjork *et al.*, 2006).

Though noise pollution is a slow and subtle killer, yet very little efforts have been made to ameliorate the same. It is, along with other types of pollution has become a hazard to quality of life (Singh and Davar, 2004).

### Material and Methods:

Haridwar is one of the most important holy cities not only of India, located in newly carved state of Uttarakhand. Haridwar is extended from latitude 29° 58' in the north to longitude 78° 13' in the east and has subtropical climate. It is about 60 kms in length from east to west and about 80 kms in width from north to south. District Haridwar lies in the foot hills of Shivalik ranges. Total area of district Haridwar is 2,360 km<sup>2</sup> with a population of 14, 44,187 as per 2001 census (Joshi and Swami 2007), which must have multiplied during last 10 years because of the creation of a New state of Uttarakhand in 2000.

Haridwar referred to as holiest city of the world for the Hindu's, well known as an important Hindu pilgrimage centre and also one of the four sacred places of the country, where the festivals of Kumbh and Ardh-Kumbh are held at an interval of twelve and six years, respectively. It is generally believed that, on normal days, Haridwar receives, on average, around 50,000 visitors (tourists and pilgrims). The number of such visitors in Haridwar easily swells to 150,000–300,000 on some semi-festive days and grows to as much as between 1.0 and

8.2 million on specific days, like Ardh-Kumbh, Kumbh, Kanwar and on certain New Moon days occurring around the year. In 2010 Kumbh has created new world record as nearly 14.5 million pilgrims took a dip in the holy River Ganga on 14 April (Hindustan Times News Paper, 14 April, 2010).

The ambient noise monitoring was carried out in areas viz. residential, commercial, industrial and silent zones in Haridwar city. The measurement of sound pressure level was carried out at five different times during the day and two times in night between 06:00-24:00 hours, with the help of Sound Level Meter. Monitoring was carried out during Feb 2009 at a height of 1.5 m and 1 m away from the chest. During each sampling of noise, 20 readings of SPL were recorded at an interval of 30 seconds in a period of 10 minutes. The minimum and maximum SPL were also recorded. Table 1 shows noise level standards of some major countries. Table 2 shows the noise levels at different zones of Haridwar city.

### Results and Discussion:

The noise level was recorded in world famous city Haridwar Uttarakhand state, India. Four different categories of area within the Haridwar city was identified for the experiment. The different categories of area were residential, commercial, silent and industrial zone. Six areas in residential, six areas in commercial zone, three areas in silent and two areas in industrial zone of Haridwar.

Table-1 shows the noise level standard in some important countries of the world. The sound levels recorded from different zones of Haridwar city were presented in table 2. The minimum and maximum SPL (sound pressure level) ranged between 56.6 to 102.4 dB at all the selected residential zone of Haridwar city. In case of commercial zone the minimum and maximum SPL ranged between 56.7 to 108.9 dB. On the other hand at all selected industrial zone the maximum and minimum SPL ranged between 52.4 to 65.8 dB. However in the case of all selected silent zone the maximum and minimum ranged between 45.0 to 87.8 dB. In the present study shows the average noise level was higher than prescribed Indian Standard at all selected sites.

Chauhan *et al.*, (2010) higher level of noise pollution in residential, commercial, Silent and Industrial zones of Moradabad city as compared to the prescribed limit of CPCB (Central Pollution Control Board), India. Chauhan and Pande, (2010) also found higher level of noise pollution in different selected zones of Dehradun city, Uttarakhand. Chauhan (2008) also reported that noise level in Haridwar and Dehradun city was higher than the prescribed limit of 9.

CPCB, India. Bodhe *et al.*, (2006) monitored the impact of noise on residential areas. Pathak *et al.*, (2008) reported that traffic noise became main reasons of headache, high BP and other stresses among the exposed individuals in adjoining working places in Varanasi City. Ganwar *et al.*, (2006) reported that noise level in Bareilly Metropolitan city was slightly higher than prescribed limit of the Central Pollution Control Board of India. Sagar and Rao (2006) observed noise level at RCD hospital and traffic junction was more than as compared to ambient air quality noise standards (AAQNS). Kisku *et al.*, 2006, also reported that in residential areas, noise ranged between 67.7 to 78.9 and 52.9 to 56.4, in commercial cum traffic areas 74.8 to 84.2 and 68.2 to 74.9 and in industrial areas 76.9 to 77.2 and 72.2 to 73.1 dB (A) during day and night time respectively at Lucknow city. During the study period we found that all the values of noise level at all the selected site was high than the prescribed limit of CPCB, Delhi.

### Conclusion and Recommendations

The present study shows that all the selected sites in Haridwar suffering from higher level of noise level, for the minimization of higher level of noise level in Haridwar city followings recommendation are suggested to combat this problem.

1. The main things in our study we found that roads are very narrow in Haridwar when it compared with traffic load presents in Haridwar throughout year. To solve this manor problem widening of the roads should be done as soon as possible.
2. The traffic volume should be reduced by diversion of traffic.
3. Plantation of trees should be done properly because it has been proved that trees with dense foliage were found to be highly effective in absorbing the acoustic noise and act as very good screens in bringing down the noise levels.
4. The large vehicles mainly trucks and busses should be banned.
5. Use of horns and music system facilitate in vehicles should be minimized or banned.
6. Alternate service lanes should be provided on both sides of the main road for the exclusive use of slow moving traffic like bicycles and cycle rickshaws.
7. Automatic traffic signals should be installed at all junctions and both vehicles drivers as well as pedestrians are made to observe traffic rules strictly.
8. The awareness program should be initiated to aware people about harmful adverse effects of noise pollution on health.

**Table1:** Noise level standards of some give countries.

Country	Industrial Area Days/Night	Commercial Area Days/Night	Residential Area Days/Night	Silent Area Days/Night
<b>Australia</b>	65/55	55/45	45/35	45/35
<b>India</b>	75/70	65/55	55/45	50/40
<b>Japan</b>	60/50	60/50	50/40	45/35
<b>U.S. (E.P.A.)</b>	70/60	60/50	55/45	45/35
<b>W.H.O.&amp; E.C.</b>	65	55	55/45	45/35

Table 2: Noise level (dB) during day and night time of different zones in Haridwar city.

Area	Noise level (dB) at Day	Noise level (dB) at Night	Ranges
<b>Residential</b>			
Arya Nagar	87.6±7.78	74.5±6.12	101.9-67.3
Shivalik Nagar	102.4±12.21	87.4±9.34	108.7-87.9
Jawalapur	99.4±8.79	76.5±4.33	109.0-87.6
Kankhal	89.8±6.32	66.7±3.65	102.1-69.7
B.H.E.L. Sector-4	94.1±6.58	77.6±5.48	107.9-74.9
Vishnu Garden	78.8±5.65	56.6±6.36	98.3-52.6
<b>Commercial</b>			
Railway Station	88.2±9.61	72.8± 7.41	98.7-72.8
Bus stand	87.4±7.21	66.4±4.54	90.4-55.2
Bhoomanand Chowk	93.5±5.23	63.7±4.44	102.2-81.3
Ranipur More	106.3±9.87	56.7±5.75	106.3-87.1
Shardhanand Chowk	98.9±10.02	58.3±7.12	103.56-63.4
Jatwara Bridge	108.9±11.44	77.8±6.87	109.6-69.7
<b>Silent</b>			
Har Ki Pauri	76.2±9.07	66.4±6.52	96.1-60.2
Govt. Hospital	87.8±10.59	51.2±6.48	97.7-50.2
Gurukul Kangri University, Haridwar	58.3±8.58	45.0±5.23	85.6-60.2
<b>Industrial</b>			
SIDCUL, Haridwar	106.7±11.04	52.4 ±6.58	108.6-91.6
Industrial area, Bahadarabad	102.4±8.55	58.6±7.63	107.1- 69.6

**Reference:**

- Bjork, J., Ardo, J., Stroh, E., Lovkvist, E., Ostergren, P. and Albin, M. (2006). Road traffic noise in southern Sweden & its relation to annoyance, disturbance of daily activities and health., *Scand. J. Work Environ. Health*, 32(5), 392-401.
- Bodhe, GL, Tajne DS, Talkhande S, Dashputre R and Dharmadhikari, DM (2006). An investigation of noise exposure on residential areas: rail car depot. *J. IAEM*, 33(2), 82-87.
- Chauhan, A. and Pande, K.K. (2010). Study of noise level in different zones of Dehradun City, Uttarakhand. *Report and Opinion*, 2(7):65-68.
- Chauhan, A. (2008). Study of noise pollution level in different places of Haridwar and Dehradun city (India). *Environment Conservation Journal*, 9(3): 21-25.
- Chauhan, A., Pawar, M., Kumar, D., Kumar, N. and Kumar, R. (2010). Assessment of Noise Level Status in Different Areas of Moradabad City. *Report and Opinion* 2010;2(5):59-61.
- Gangwar, KK., Joshi, BD and Swami, A. (2006). Noise pollution status at four selected intersections in commercial areas of Bareilly Metropolitan city. *Him. J. Env. And Zoo.*, 20(1), 75-77.
- Joshi, P.C., and Swami, A. (2007). Physiological responses of some tree species under roadside automobile pollution stress around city of Haridwar, India. *Environmentalist* 27: 365-374.
- Kisku, G.C., Sharma, K., Kidwal, M.M., Barman, S.C., Khan, A.H., Singh, R., Mishra, D. and Bhargava, S.K. 2006. Profile of noise pollution in Lucknow city and its impact on environment. *J. Environ. Biol.*, 27(2): 409-412.
- Pathak V, Tripathi BD, Mishra VK (2008) Evaluation of traffic noise pollution and attitudes of exposed individuals in working place. *Atmos. Environ* 42(16):3892–3898.
- Pawar, C.T. and Joshi, MV (2005). Urban development and sound level in Ichalkaranji city, Maharashtra. *Indian J. Environ. and Ecolplan.*, 10(1), 177-181.
- Pratap Kumar Padhy\*and Bijaya Kumar Padhi (2008). Assessment of noise quality in bolpursantiniketan areas (India). *Journal of Environmental Research and Development*, 3(1), 301-306.
- Sangal. P.P., Little noise about noise pollution, Financial Daily from THE HINDU group of publications, Oct. 08, 2002.
- Sagar, T. V. and Rao, G. N. 2006. Noise pollution levels in Visakhapatnam city (India). *Journal of Environ. Science & Engg.* 48(2): 139-142.
- Singh, N. and Davar, S. C. (2004). Noise Pollution-Sources, Effects and Control. *J. Hum. Ecol.*, 16(3): 181-187
- Skarberg, A. and Ohrstrom, J.F. (2002). Adverse health effects in relation to urban residential sound scopes. *J. Sound Vib.*, 250(1), 151-155.
- WHO, 1980. Environmental health criteria on Noise. 12. World Health Organisation.

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